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| EXAMINER | |
|---|---|
| CONOVER, DAMON M | |

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

| Office Action Summary | Application No. | Applicant(s) |
|---|---|---|
| | 10/622,519 | CHEREK ET AL. |
| | Examiner | Art Unit |
| | Damon Conover | 2624 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on 09 October 2007.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) 1-26 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-26 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Continued Examination Under 37 CFR 1.114*

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9 October 2007 has been entered.

### *Response to Arguments*

2. Applicant's arguments with respect to independent claims 1 and 14 have been considered but are moot in view of the new ground(s) of rejection.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3, 8, 14, 16, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Born et al. (U.S. Patent 4,609,940) and the book, Digital Image Processing: Principles and Applications, by Gregory A. Baxes, in view of Paragios et al. (U.S. Patent Publication 2003/0053667).

**With respect to claim 1**, Born et al. disclose a radiodiagnostic device with a motor-adjustable table (patient bed), motor-adjustable primary radiation diaphragm

(treatment unit), and a microcomputer 17 (Figure 2 and column 1, lines 7-10). The motor-adjustable table (patient bed) is movable in the longitudinal and transverse directions (column 2, lines 33-37). The device includes a television camera 10 (image-recording device) for acquiring an image of an exterior of the patient on the table (patient bed) and displaying the image on a monitor 12 (display screen) that is connected to the microcomputer 17. For adjusting the table 1, the region of interest is marked on the monitor 12 with light pen 13 and thereafter the table 1 is adjusted so that the marked region (suggested scan region) is automatically displayed in the center of the monitor 12 and is optimally focused (column 2, lines 12-22). In order for the coordinates of the patient on the monitor 12 to correspond to the actual coordinates of the patient, it is inherent that the computer identifies a spatial correlation between the treatment unit and the image-recording device.

Born et al. do not describe that a subtraction image is obtained by subtracting an empty image of a patient bed from the image of a patient on the patient bed.

Baxes describes that is well-known in the field of image processing to remove common background image information from images of identical scenes by subtracting one image from another. The image resulting from the subtraction shows only the foreground objects of interest. The static background elements are eliminated (page 335 and Figures IOS.5a-c).

It would have been obvious to one of ordinary skill in the art at the time of the invention to segment the image, as taught by Baxes, before the radiodiagnostic device

of Born et al. displays it on a monitor, in order to discriminate between the pixels which make up the patient and those which make up the background and the patient bed.

Born et al. describe that an operator chooses the patient body region using a light pen. Neither Born et al., nor Baxes describe that a body region is detected by analyzing the acquired image and comparing patient geometry to statistically determined proportions of human anatomy.

Paragios et al. disclose a system and method for segmenting the left ventricle of the heart using a contour propagation model that integrates visual information and anatomical constraints (paragraph 2). The left ventricle of the heart (body region of the patient) is detected by analyzing image data along with anatomical constraints. The anatomical constrains are based on a priori knowledge of the anatomy of the heart (statistically-determined proportions of human anatomy) (paragraphs 36-37). The result is the segmentation of the boundary of the left ventricle. An image rendering unit displays the boundary of the left ventricle superimposed on the original image data (displaying a suggested scan area) (paragraphs 45-46 and Figures 3a-b).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include the step using both image data and a priori knowledge of human anatomy to detect a body region, as taught by Paragois et al., in the radiodiagnostic device of Born et al. and Baxes, in order to accurately capture an image of a moving body region (Paragios et al., paragraph 37).

**With respect to claim 3**, Born et al. describe that the region of interest is marked on the monitor 12 with light pen 13 and thereafter the table 1 is adjusted so that

the marked region (suggested scan region) is automatically displayed in the center of the monitor 12 and is optimally focused (optically emphasized) (column 2, lines 12-22).

**With respect to claim 8**, Born et al. describe that the region of interest (suggested scan area) is marked on the monitor 12 with light pen 13, and the table 1 is adjusted so that the marked region (suggested scan region) is automatically displayed in the center of the monitor 12 (manual alteration of the suggested scan area displayed on the display screen) (column 2, lines 12-22).

**With respect to claims 14, 16, and 21**, the "arrangement for positioning a patient in a medical device" corresponds to the "method for positioning a patient in a medical device" of claims 1, 3, and 8. The argument is the same as is addressed above.

4. Claims 2, 4-7, 9-10, 13, 15, 17-20, 22-23, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Born et al., Baxes, and Paragios et al. as applied to claims 1, 3, 8, 14, 16, and 21 above, and further in view of Banks et al. (U.S. Patent 6,674,449).

**With respect to claims 2 and 7**, as discussed above, Born et al. disclose a radiodiagnostic device with a motor-adjustable table (patient bed), motor-adjustable primary radiation diaphragm (treatment unit), and a microcomputer 17 (Figure 2 and column 1, lines 7-10). As discussed above, Baxes describes that is well-known in the field of image processing to remove common background image information from images of identical scenes by subtracting one image from another (page 335 and Figures IOS.5a-c). As discussed above, Paragois et al. disclose a system and method

for segmenting the left ventricle of the heart using a contour propagation model that integrates visual information and anatomical constraints (paragraph 2).

Neither Born et al., Baxes, nor Paragios et al. describe that two different body regions are detected and displayed.

Banks et al. disclose a system which can be used to interface with any of several different medical imaging system types (column 1, lines 15-18). The system interface comprises a display and a programmed data processor for providing a uniform interface image on the display (column 5, lines 54-62). The system also includes a patient positioning system that receives commands to move a patient cradle and transport the patient to the desired position for the scan (column 7, line 65 – column 8, line 2). Banks et al. describe that the display screen is able to display a plurality of detected scan areas (Figure 6 and column 14, lines 52-55).

It would have been obvious to one of ordinary skill in the art at the time of the invention to display a plurality of scan areas on the same display screen, as taught by Banks et al., in the radiodiagnostic device of Born et al., Baxes, and Paragios et al., in order to allow a technologist to select an image of a scan area from the plurality of detected scan areas (Banks et al., column 14, lines 45-48).

**With respect to claims 4 and 6**, as discussed above, Born et al. disclose a radiodiagnostic device with a motor-adjustable table (patient bed), motor-adjustable primary radiation diaphragm (treatment unit), and a microcomputer 17 (Figure 2 and column 1, lines 7-10). As discussed above, Baxes describes that is well-known in the field of image processing to remove common background image information from

images of identical scenes by subtracting one image from another (page 335 and Figures IOS.5a-c). As discussed above, Paragois et al. disclose a system and method for segmenting the left ventricle of the heart using a contour propagation model that integrates visual information and anatomical constraints (paragraph 2).

Neither Born et al., Baxes, nor Paragios et al. describe that a designation of the detected body regions is manually entered into the computer.

As discussed above, Banks et al. disclose a system which can be used to interface with any of several different medical imaging system types (column 1, lines 15-18). Banks et al. describe that the system includes a keyboard and a mouse (column 7, lines 4-10) and that a technologist can add, delete, or modify information corresponding to any of the information listed on the image (column 11, lines 3-6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add information to an image containing the body region, as taught by Banks et al., in the radiodiagnostic device of Born et al., Baxes, and Paragios et al., in order to allow a technologist to include relevant information directly on the image.

**With respect to claim 5**, as discussed above, Born et al. disclose a radiodiagnostic device with a motor-adjustable table (patient bed), motor-adjustable primary radiation diaphragm (treatment unit), and a microcomputer 17 (Figure 2 and column 1, lines 7-10). As discussed above, Baxes describes that is well-known in the field of image processing to remove common background image information from images of identical scenes by subtracting one image from another (page 335 and Figures IOS.5a-c). As discussed above, Paragois et al. disclose a system and method

for segmenting the left ventricle of the heart using a contour propagation model that integrates visual information and anatomical constraints (paragraph 2).

Neither Born et al., Baxes, nor Paragios et al. describe that a designation of the detected body regions is manually entered into the computer.

As discussed above, Banks et al. disclose a system which can be used to interface with any of several different medical imaging system types (column 1, lines 15-18). Banks et al. describe that the system includes a keyboard and a mouse (column 7, lines 4-10) and that a technologist can add, delete, or modify information corresponding to any of the information listed on the image. The information is added, deleted, or modified by selecting an icon from a displayed menu (column 11, lines 2-6).

It would have been obvious to one of ordinary skill in the art at the time of the invention to add information to an image containing the body region, as taught by Banks et al., in the radiodiagnostic device of Born et al., Baxes, and Paragios et al., in order to allow a technologist to include relevant information directly on the image.

**With respect to claims 9-10**, as discussed above, Born et al. disclose a radiodiagnostic device with a motor-adjustable table (patient bed), motor-adjustable primary radiation diaphragm (treatment unit), and a microcomputer 17 (Figure 2 and column 1, lines 7-10). As discussed above, Baxes describes that is well-known in the field of image processing to remove common background image information from images of identical scenes by subtracting one image from another (page 335 and Figures IOS.5a-c). As discussed above, Paragois et al. disclose a system and method for segmenting the left ventricle of the heart using a contour propagation model that

integrates visual information and anatomical constraints (paragraph 2). As discussed above, Banks et al. disclose a system which can be used to interface with any of several different medical imaging system types (column 1, lines 15-18). Banks et al. describe that the system includes a keyboard and a mouse (column 7, lines 4-10).

Neither Born et al., Baxes, Paragios et al., nor Banks et al. specifically describe that a scan area is selected by arranging two lines at the edges of the desired scan area.

However, the examiner takes Official Notice (see MPEP 2144.03) that both the concept and the advantages of using a mouse to select an area in an image by arranging a box around the desired area are well known and expected in the art. By definition the box will contain two parallel lines at the edges of the suggested scan area.

It would have been obvious to one of ordinary skill in the art at the time of the invention select an area in an image by arranging a box around the desired area, in the radiodiagnostic device of Born et al., Baxes, Paragios et al., and Banks et al., in order to allow a technologist to focus on one specific area of interest in the image.

**With respect to claims 15, 17-20, and 22-23**, the "arrangement for positioning a patient in a medical device" corresponds to the "method for positioning a patient in a medical device" of claims 2, 4-7, and 9-10. The argument is the same as is addressed above.

5. Claims 11-13 and 24-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Born et al., Baxes, and Paragios et al. as applied to claims 1, 3, 8, 14, 16, and 21 above, and further in view of Banks et al. and Cosman (U.S. Patent 6,405,072).

**With respect to claims 11-13**, as discussed above, Born et al. disclose a radiodiagnostic device with a motor-adjustable table (patient bed), motor-adjustable primary radiation diaphragm (treatment unit), and a microcomputer 17 (Figure 2 and column 1, lines 7-10). The motor-adjustable table (patient bed) is movable in the longitudinal and transverse directions (column 2, lines 33-37). The device includes a television camera 10 (image-recording device) for acquiring an image of an exterior of the patient on the table (patient bed) and displaying the image on a monitor 12 (display screen) that is connected to the microcomputer 17. For adjusting the table 1, the region of interest is marked on the monitor 12 with light pen 13 and thereafter the table 1 is adjusted so that marked region (suggested scan region) is automatically displayed in the center of the monitor 12 and is optimally focused (column 2, lines 12-22). In order for the coordinates of the patient on the monitor 12 to correspond to the actual coordinates of the patient, it is inherent that the computer identifies a spatial correlation between the treatment unit and the image-recording device. As discussed above, Baxes describes that is well-known in the field of image processing to remove common background image information from images of identical scenes by subtracting one image from another (page 335 and Figures IOS.5a-c). As discussed above, Paragios et al. disclose a system and method for segmenting the left ventricle of the heart using a

contour propagation model that integrates visual information and anatomical constraints (paragraph 2). The left ventricle of the heart (body region of the patient) is detected by analyzing image data along with anatomical constraints. The anatomical constrains are based on a priori knowledge of the anatomy of the heart (statistically-determined proportions of human anatomy) (paragraphs 36-37). The result is the segmentation of the boundary of the left ventricle. An image rendering unit displays the boundary of the left ventricle superimposed on the original image data (displaying a suggested scan area) (paragraphs 45-46 and Figures 3a-b).

Neither Born et al., Baxes, nor Paragios et al. describe that two different body regions are detected and displayed.

Banks et al. disclose a system which can be used to interface with any of several different medical imaging system types (column 1, lines 15-18). The system interface comprises a display and a programmed data processor for providing a uniform interface image on the display (column 5, lines 54-62). The system also includes a patient positioning system that receives commands to move a patient cradle and transport the patient to the desired position for the scan (column 7, line 65 – column 8, line 2). Banks et al. describe that the display screen is able to display a plurality of detected scan areas (Figure 6 and column 14, lines 52-55).

It would have been obvious to one of ordinary skill in the art at the time of the invention to display a plurality of scan areas on the same display screen, as taught by Banks et al., in the radiodiagnostic device of Born et al., Baxes, and Paragios et al., in

order to allow a technologist to select an image of a scan area from the plurality of detected scan areas (Banks et al., column 14, lines 45-48).

Neither Born et al., Baxes, Paragios et al., nor Banks et al. describe that a second image of the patient is acquired with a second image-recording device.

Cosman discloses a system for positioning and repositioning a portion of a patient's body with respect to a treatment or imaging machine. The system includes multiple cameras (image-recording devices) to view the body and the machine (abstract). The multiple cameras are used to capture three-dimensional scan data, therefore it is inherent that the second camera has a different recording axis from the first (column 3, lines 29-32). Figure 8 shows that recording axis of camera 140A is orthogonal to that the recording axes of cameras 140B and 140D. Additionally, Figure 8 shows that images of the patient are acquired for each movement plane (column 14, line 61 – column 15, line 7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to include the plurality of cameras, as taught by Cosman, in the radiodiagnostic device of Born et al., Baxes, Paragios et al., and Banks et al., in order to capture three-dimensional data (Cosman, column 3, lines 29-32).

**With respect to claims 24-26**, the "arrangement for positioning a patient in a medical device" corresponds to the "method for positioning a patient in a medical device" of claims 11-13. The argument is the same as is addressed above.

**Conclusion**

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Fujita et al. (U.S. Patent 4,773,086) disclose an operator console for inputting scanning conditions of an X-ray CT (column 1, lines 1-14). The console includes pushbuttons for selecting an anatomy section to be scanned (column 3, lines 3-10 and Figure 4).

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Damon Conover whose telephone number is (571) 272-5448. The examiner can normally be reached Monday – Friday, 8:30 a.m. - 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Werner, can be reached at (571) 272-7401. The fax number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at (866) 217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call (800) 786-9199 (IN USA OR CANADA) or (571) 272-1000.

DMC

BRIAN WERNER
SUPERVISORY PATENT EXAMINER